

What is claimed is:

1. A content relay node having a function of routing data packets in an application layer, comprising:

5 a receiving unit having a plurality of input ports;

a transmitting unit having a plurality of output ports;

a data processing unit;

10 a switch unit for connecting said receiving unit, said transmitting unit, and said data processing unit;

a plurality of storages having a data storing function; and

15 a routing control unit for controlling said receiving unit, said transmitting unit, said switch unit, and said storages,

wherein each of said data packets includes a storage address for identifying said plurality of storages on a network and a data attribute,

20 said receiving unit has means for receiving a data packet, means for extracting the storage address and the data attribute from the data packet, means for transferring the data attribute to said routing control unit, and means for sending the data packet
25 to said switch unit,

said routing control unit has means for selecting, as a destination of a received data packet, one of said transmitting unit and said data processing unit on the basis of routing information including the storage address and instructing said switch unit to make switching,

said storage has means for storing the received data,

said switch unit has means for switching a route on the basis of the control signal,

said data processing unit has means for storing or transmitting data on the basis of the data attribute, and

said transmitting unit has means for processing the header of a data packet in accordance with a control signal from said control unit and means for transferring the data packet to a neighboring relay node.

2. The content relay node according to claim 1, further comprising:

means for holding, in the control unit, a storage routing table (SRT) expressed by using identification information (network storage address: NSA) for identifying a storage on a network;

and

means for determining a destination NSA corresponding to the destination NSA by using the SRT.

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3. The content relay node according to claim 2, wherein said NSA is expressed by one piece of or a combination of a plurality of pieces of information indicative of position of a relay node on a network, identification information of a storage distinctive
10 physically or logically, and information for specifying a data storage location by designating a directory or a block address in a storage area.

15 4. The content relay node according to claim 1, wherein the storage has a memory or a memory space constructed by one HDD or a plurality of media.

5. The content relay node according to claim 1,
20 wherein said switch unit has means for sending an input data packet to the data processing unit in order to store received data into the storage, and

said storage has means for receiving data from said data processing unit and storing the received
25 data in the node at least until transfer of the data

to the next relay node is completed.

6. The content relay node according to claim 5, further comprising at least one of means for storing received data in the form of a packet and means for rebuilding data from a plurality of packets and storing the rebuilt data in the node, in said data storing process.

10 7. The content relay node according to claim 1, further comprising means for reading out data stored in the node and re-transmitting the data in the case where the receiving unit detects a data transmission request.

15 8. The content relay node according to claim 1, further comprising means for determining a route and constructing an SRT on the basis of data size of a received data flow and available memory space in the next storage for relay at the time of determining
20 correspondence, to be registered in the SRT, between a destination NSA and the next NSA for relay.

9. The content relay node according to claim 1,
25 further comprising means for notifying the other

nodes constructing a content routing network of available memory spaces to each other.

10. The content relay node according to claim 1,
5 wherein said receiving unit has means for determining whether data supplied to an input port is to be routed on the basis of a storage address or not.

11. The content relay node according to claim 1,
10 further comprising means for using route information obtained by function of a transfer protocol of a lower layer at the time of determining a transfer route.

12. The content relay node according to claim 1,
15 further comprising means for dividing data into a plurality of packets in an application layer as necessary and transmitting the packets.

13. The content relay node according to claim 1,
20 wherein said data packet is comprised of a header portion including a data attribute of the application layer and data portion including the contents of data.

25 14. The content relay node according to claim 1,

wherein said data packet includes in a header portion thereof a destination NSA and a source NSA of the data packet.

5 15. The content relay node according to claim 1, wherein said data packets include, as a data attribute included in the header, data identifiers indicating that the data packets are generated from the same data, and packet identifiers indicative of
10 the order of the data packets as re-building information in the case where the data is divided and the resultant is transmitted.

16. The content relay node according to claim 1,
15 wherein said data packet includes priority information of the data packet in its header in order to preferentially determine the route according to a data attribute.